

Appl. No. 10/569,511
Amtd. dated June 15, 2007
Reply to Office action of Mar. 15, 2007

REMARKS

Claims 4 and 6-9 are presently in the application. Claims 1-3 and 5 have been canceled.

Claims 6-9 have been rejected under 35 U.S.C. 112, second paragraph, as indefinite. The examiner reads the language “injected material” as the material inside the dies 20 and 21, rather than as the billet B. Claim 6 has been amended to more clearly recite that it is the circumference of the semi-molten cast iron material which is covered prior to the semi-molten cast iron material being injected through the gate.

Claim 4 has been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as unpatentable over Nakamura et al (US 6,053,997) and claim 5 has been rejected under 35 U.S.C. 103(a) as unpatentable over Nakamura et al in view of Rollins et al (US 5,730,201). Reconsideration of the rejections is requested.

Claim 4 has been amended to incorporate the language of claim 5 and now recites, inter alia, that the gate member has a projecting portion formed all around the gate hole facing the injection path. Nakamura et al does not teach a gate member with a projecting portion formed all around the gate hole facing the injection path. Therefore, Nakamura et al does not anticipate claim 4.

Claim 4 requires a gate located at the entry of the die cavity so as to throttle entry from the injection means into the die cavity. The claim further requires that the gate is a separate gate member and is disposed at the entry of the cavity each time an injection casting

Appl. No. 10/569,511
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operation is carried out and is taken out together with the casting after the injection casting operation is completed and that the gate member has a projecting portion formed all around the gate hole facing the injection path.

Rollins teaches an oxide remover 30 situated between the casting chamber 11 and the mold 70. The oxide remover has a projecting portion 34 facing the mold 70, not the injection path, as required by the claim language. Claim 4 calls for the throttling gate member to have the projection. The oxide remover 30 is not the throttling gate member.

By forming the projection all around the gate hole, applicants' apparatus is able to prevent scale from mixing into the mold cavity. Rollins, on the other hand, has a recess 44 situated in only the lower part of the opening 42.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Neither Nakamura et al nor Rollins et al teaches or suggests an apparatus for thixocasting a cast iron of the type recited in claim 4 in which a separate throttling gate member has a projecting portion formed all around the gate hole facing the injection path. Accordingly, claim 4 is not rendered obvious by the combined teachings of Nakamura et al and Rollins et al.

Claims 6 and 8 have been rejected under 35 U.S.C. 103(a) as unpatentable over Nobuhiro (JP 3-221,253). Reconsideration of the rejection is requested.

Claim 6 is directed to a method of thixocasting a cast iron, which comprises filling a cavity in dies with semi-molten cast iron material that is injected through a gate that throttles the entry of the cavity under a pressure, the improvement comprising the step of covering a circumference of the semi-molten cast iron material prior to being injected through the gate by a steel sheet 0.2 to 0.5 mm thick and having a melting point higher than that of the semi-molten cast iron material.

Nobuhiro teaching wrapping a copper foil 2 completely around the billet 1, including the ends of the billet. The billet of applicants' method is not wrapped completely. Only the circumference of the circular billet is covered and both end faces of the circular billet are left uncovered. Thus, in applicants' method, the steel sheet can be folded as the billet enters the mold cavity. In other words, the steel sheet does not enter the mold cavity. In Nobuhiro, the copper foil is completely around the billet and the foil on the end face can enter the mold cavity and contaminate the casting.

It is also pointed out that Nobuhiro uses a foil, not a sheet having a thickness of .2 to .5 mm thick. Applicants' specification teaches that when a thin steel sheet is used, the steel sheet is folded up in front of the gate when the injected material is injected under pressure, so that the scale formed on the injected material is captured by the folded steel sheet, thereby to prevent it from mixing in the cavity. Applicants' specification also teaches that the effect of preventing the injected material from straining when heated into semi-molten state cannot be obtained when the thickness of the sheet is less than 0.2 mm and that a thin steel sheet cannot

Appl. No. 10/569,511
Amdt. dated June 15, 2007
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be folded up well during the pressured injection operation and filling failure may result when the thickness is more than 0.5 mm. See, para.[0025] and [0075]. Nobuhiro does not recognize the benefits taught by applicants of a sheet .2 to .5 mm thick, as opposed to a thin foil.

To summarize, Nobuhiro does not teach: (1) a sheet .2 to .5 mm thick; (2) a steel sheet; and (3) wrapping the circumference and not the ends of the billet.

The examiner is of the opinion that it would have been obvious to use a steel sheet in place of copper foil dependent on the composition of the billet to be wrapped. However, the examiner has not provided any evidence that one of ordinary skill in the art would have substituted steel for copper or a sheet .2 to .5 mm thick for the foil taught by Nobuhiro.

A rejection based on section 103 clearly must rest on a factual basis, and these facts must be interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, all facts must be considered. The Patent Office has the initial duty of supplying the factual basis for its rejection. It may not, because it may doubt that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

The examiner's rejection of claims 6 and 8 is clearly based on speculation, not facts. Withdrawal of the rejection is in order.

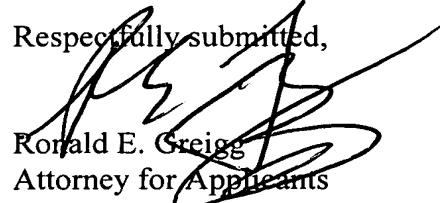
Appl. No. 10/569,511
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Claims 7 and 9 have been rejected under 35 USC 103(a) as unpatentable over Nobuhiro in view of Nakamura et al and Rollins et al. Reconsideration of the rejection is requested.

Claim 7 is dependent on claim 6 and the arguments set forth above with regard to the rejection of claim 6 apply equally to claim 7. In addition, claim 7 requires the step of injecting the semi-molten cast iron material through a gate hole having a projecting portion formed all around the gate hole and facing the injection path.

None of Nobuhiro, Nakamura et al and Rollins et al teaches or suggests a method for thixocasting a cast iron as recited in claim 7 including the step of injecting the semi-molten cast iron material through a gate hole having a projecting portion formed all around the gate hole and facing the injection path. Accordingly, claims 7 and 9 are not rendered obvious by the combined teachings of Nobuhiro, Nakamura et al and Rollins.

Entry of the amendment and allowance of the application are respectfully requested.

Respectfully submitted,

Ronald E. Greigg
Attorney for Applicants
Registration No. 31,517
CUSTOMER NO. 02119

GREIGG & GREIGG, P.L.L.C.
1423 Powhatan Street, Suite One
Alexandria, VA 22314
Tel. (703) 838-5500
Fax. (703) 838-5554
REG/JFG/nc

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